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CLAIMS:

1.   An X-ray examination apparatus (1) comprising:
    -   a controllable X-ray source (1c) arranged to generate an X-ray beam (1f);
    -   an X-ray detector (1d) arranged to produce a first image upon an interception of the X-ray beam (1f);
    -   image processing means (3) arranged to process at least a part of the first image with a grey-level compression function (3a) in order to compress the first image into a second image;
    -   control means (6) arranged to compute an average grey value of pixels of the second image and to provide a dose control signal (C) to the X-ray source (1c) in order to control the X-ray beam (1f), the dose control signal (C) being determined from a comparison between the computed average grey level value and a pre-stored reference value (CA).

2.   An apparatus according to Claim 1, wherein the grey level compression function (CC) comprises a plurality of compression ranges with substantially different grey level compression factors.

3.   An X-ray apparatus according to Claim 2, wherein the grey-level compression function (CC) comprises a monotonous function with a first linear range (I), a second linear range (II) and a third linear range (III), the second linear range comprising the pre-stored reference value (CA), the grey level compression factor of the second linear interval (II) having substantially a value of one, grey level compression factors of the first linear range (I) and the third linear range (III) being substantially lower than one.

4.   An X-ray apparatus according to Claim 3, wherein said apparatus further comprises computing means (8) arranged to construct a grey-level histogram of the first image and to determine corresponding boundaries of the first linear range, the second linear range and the third linear range from said grey-level histogram.

5.   An X-ray apparatus according to Claims 3 or 4, wherein said computing

means (8) is further arranged to calculate a loop gain correction factor and to apply the loop

gain correction factor to the dose control signal.

5   6.   A method of controlling an output of an X-ray source of an X-ray examination

apparatus by means of a dose control signal, said method comprising the steps of:

- acquiring a first X-ray image;

- processing at least a part of the first X-ray image with a grey-level compression

  function in order to compress the first X-ray image into a second X-ray image;

10   - computing an average grey level value of pixels of the second X-ray image;

- comparing the computed average value and a pre-stored reference value;

- providing a dose control signal to the X-ray source, said dose control signal being

  determined from said comparison.

15   7.   A method according to Claim 6, wherein for the grey level compression

function a function with a plurality of compression ranges is selected, wherein consecutive

compression ranges have a substantially different grey level compression factors.

8.   · A method according to Claim 7, wherein for the grey-level compression

20   function a monotonous function with a first linear range, a second linear range and a third

linear range is selected, the second linear range comprising the pre-stored reference value, the

grey level compression factor of the second linear range having substantially a value of one,

grey level compression factors of the first linear range and the third linear range being

substantially lower than one.

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9.   A method according to Claim 8, wherein said method further comprises the

steps of:

- constructing a grey-level histogram of the first image;

- determining corresponding boundaries of the first linear range, the second linear

30   range and the third linear range from said grey-level histogram.

10.   A method according to Claims 8 or 9, wherein the method further comprises

the steps of:

- calculating a loop gain correction factor;

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- applying the loop gain correction factor to the dose control signal.